

# The genus *Goniodoma* Zeller (Lepidoptera: Coleophoridae) from China

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**Abstract:** There are only five species of the genus *Goniodoma* Zeller, 1849 in the world. This paper deals with the two species of this genus found in China. Among them, *G. auroguttella* Zeller, 1849 from Ningxia is newly recorded in China. Photographs of adults, genitalia and distribution are provided, along with a key to the known species of *Goniodoma* in China.

**Key words:** Microlepidoptera; Gelechioidea; taxonomy; redescription

中国金鞘蛾属 *Goniodoma* Zeller 研究 (鳞翅目: 鞘蛾科)

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**摘要:** 金鞘蛾属 *Goniodoma* Zeller, 1849 在全世界只有 5 个种, 本文涉及该属分布中国的 2 个种, 其中分布宁夏的滨藜金鞘蛾 *G. auroguttella* Zeller, 1849 是中国新记录种。文中提供了新记录种的成虫和外生殖器特征和生态环境图及分种检索表。

**关键词:** 小蛾类; 麦蛾总科; 分类; 新描述

## Introduction

The family Coleophoridae is comprised of more than 1340 described species in five genera worldwide (Baldizzone *et al.* 2006). Zeller (1849) established the genus *Goniodoma* with *G. auroguttella* Zeller, 1849 as the type species. *Goniodoma* is a small genus in the family Coleophoridae, consisting of five species to date (Li & Zheng 2002). Bauer *et al.* (2012) considered *Goniodoma* to be a synonym of *Coleophora* based on results from molecular phylogeny, larval case and host-plant data from Europe. But they used only one species *G. limoniella* (Stainton, 1884) in their study for this large family Coleophoridae and their results should be considered carefully. In this study, we still temporarily retain the genus *Goniodoma* as a valid taxon.

*Goniodoma sinica* Li & Zheng, 2002 was the only species recorded from China prior to this study. The aim of the present study is to redescribe one newly recorded species, *Goniodoma auroguttella* Zeller, 1849 from a desert area in western China.

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## Material and methods

The specimens examined were collected by light trap. Adults were examined with an Olympus SZX16 stereomicroscope. Dissection and slide mounting of genitalia followed the methods introduced by Li (2002). Images of adults were taken with a Leica M205A stereomicroscope and images of genitalia were captured with a Leica DM750 microscope. Both used Leica Application Suite 4.2 software.

All studied specimens are deposited in the Insect Collection, College of Life Sciences, Nankai University (NKU), Tianjin, China.

## Taxonomy

### *Goniodoma* Zeller, 1849

*Goniodoma* Zeller, 1849: 410.

Type species: *Goniodoma auroguttella* Zeller, 1849.

General characters. Head smooth, scaled; antenna slightly shorter than forewing, scape expanded, covered with scales; second segment of labial palpus slightly stout, apex with ventral tuft; haustellum long. Forewing with  $M_3$  absent,  $R_5$  and  $M_1$  stalked, usually a variety of yellow, with silvery scales forming spots. Hindwing with  $M_3$  and  $CuA_1$  absent. Hind tibia smooth.

Male genitalia. Gnathos large, oval; tegumen wide; cucullus and sacculus separate, with several large setae distally; cornuti absent.

Female genitalia. Sterigma sclerotized; ostium bursae usually narrow and long; ductus bursae membranous, spinulate section distinct, straight, median lamina absent; signum large.

Distribution. The genus *Goniodoma* Zeller consists of five species occurring in the southern Europe, northern Africa, western Asia and China.

### Key to Chinese species of the genus *Goniodoma* Zeller

1. Head grey with metallic. Postocular scales golden yellow. Forewing with a silvery white streak on fold. Succulus triangular, widest part wider than valva in male genitalia ..... *G. auroguttella*
- Head white slightly with grey. Postocular scales white. Forewing with a silvery grey streak on fold. Succulus cylindrical, narrow, about half width of valva in male genitalia ..... *G. sinica*

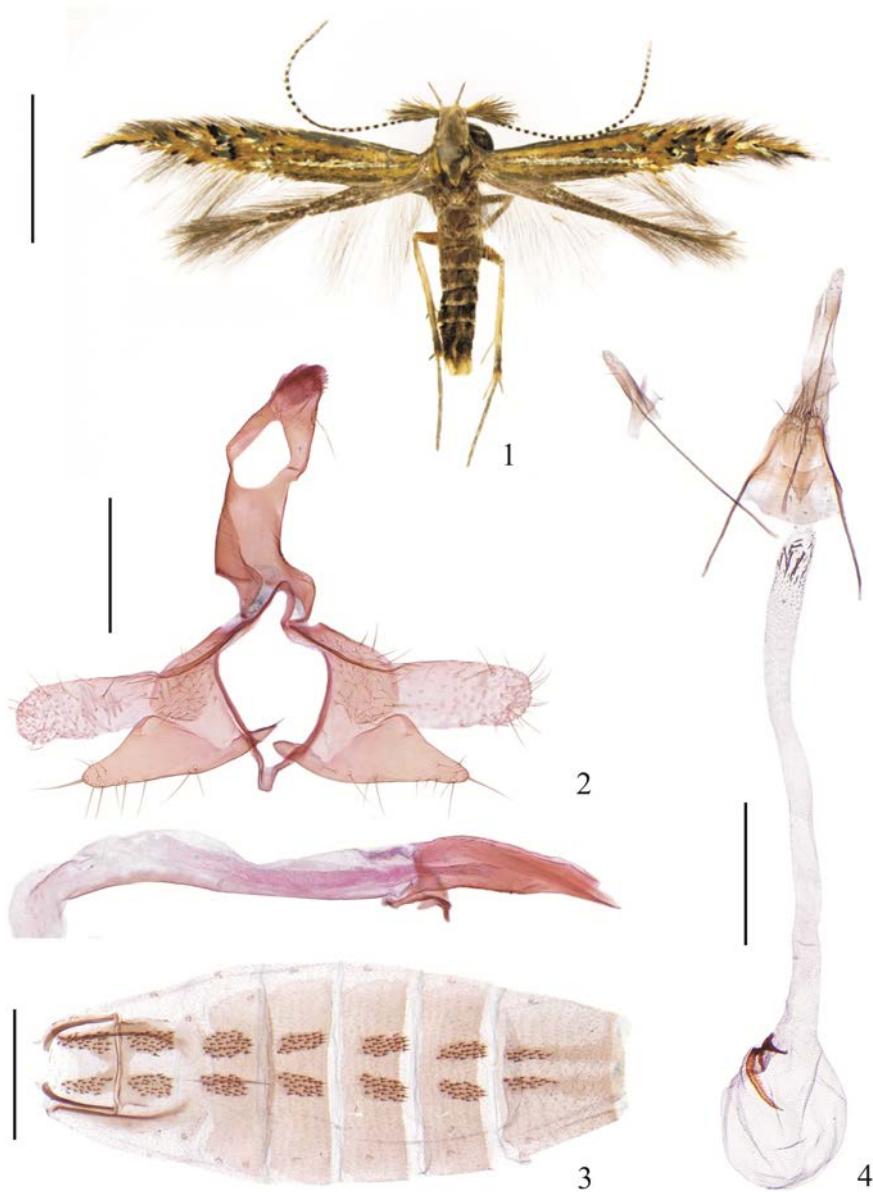
### 1. *Goniodoma auroguttella* Zeller, 1849 (Figs 1–4), new record to China

*Goniodoma auroguttella* Zeller, 1849: 410; Toll, 1953: 234; Capuse, 1970: 119; Razowski, 1990: 33; Baldizzone *et al.*, 2006: 124; Baldizzone, 2019: 589.

Redescription. Adult (Fig. 1). Wingspan: 8.5–10.0 mm. Head grey, metallic, vertex tinged with light yellow, frons yellowish white. Postocular scales golden yellow. Labial palpus porrect, white, more or less light yellow; second segment longer than diameter of compound eye, apex with ventral tuft; third segment short, about 1/2 length of second, apex acute. Scales of haustellum greyish white. Antenna: scape greyish white, tinged with yellow, anteriorly edged with long scales; flagellum annulated with white and black. Thorax greyish white. Tegula yellow. Forewing: upper surface yellow, costal margin white; costal streak silvery; dorsum streak greyish brown; a silvery white streak on fold; cell with a longitudinal silvery streak at mid portion, apically with large silvery spot; scattered with a few silvery spots from distal 1/2 of costa to apex, all of streaks and spots scattered with black scales; ventral surface

light brown; cilia greyish brown. Hindwing and cilia greyish brown. Leg white; outer surface of hind tibia light yellow, apex with hairs.

Abdomen (Fig. 3). Each tergum with a pair of oblong setal patches, about as long as two times width; setal patch of first tergum elliptical with 15–25 spiniform setae in male and rectangle with 23–32 spiniform setae in female; second setal patch with 20–25 densely arranged spiniform setae in male and 31–35 in female.



Figures 1–4. Morphology of *Goniodoma auroguttella* Zeller. 1. Adult, ♀; 2. Male genitalia, slide No. DJQ18297; 3. Abdomen; 4. Female genitalia (3, 4. slide No. DJQ18667). Scale bars = 2.0 mm (Fig. 1); 0.2 mm (Fig. 2); 0.5 mm (Figs 3, 4).



Figures 5–7. Habitats of *Goniodoma auroguttella* Zeller. 5. Elm forest (*Ulmus pumila* Linn.); 6. *Chenopodium* sp.; 7. Community of *Chenopodium* sp., *Amaranthus* sp. and *Halogeton* sp.

Male genitalia (Fig. 2). Gnathos densely with short setae; basal arms broad, longer than gnathos. Tegumen sub-rectangular, anterior margin almost straight, caudal margin concave, lateral margins curved basally; pedunculus band-shaped, nearly 1/3 length of tegument, distal gradually narrowed. Transtilla cestiform, long and narrow. Vinculum strongly sclerotized. Valvula sclerotized, about semicircular, dorsal margin obliquely straight, width about half length of cucullus, ventral surface suffused with short setae. Cucullus long rectangle, apex rounded, with setae, basal 1/3 gently concave and near costa with a sclerotized ridge. Sacculus broad, triangular, wider than cucullus, gradually narrowed towards distal portion, apex bluntly rounded with a large seta; ventral margin nearly as long as cucullus, gently curved, with sparse setae, basal 1/4 narrow, digitated; dorsal margin about half of ventral margin in length. Saccus short and small, U-shaped. Juxta small; juxta rod sclerotized, dorsal margin gently sinuous, ventral margin almost straight; outer sheath membranous, nearly 3 times as long as juxtal rod, annulus and lamina indistinct, cornutus absent.

Female genitalia (Fig. 4). Papillae anales long, elliptical. Apophyses posteriores about as long as 2 times apophyses anteriores; apophyses anteriores slightly shorter than length of 8th abdominal segment, trapezoidal, caudal margin gently convex, but concaved medially, edged with long bristles. Ostium bursae wider than half width of sterigma at posterior margin, gently

concaved medially. Colliculum sclerotized, funnel-shaped. Ductus bursae membranous, about 3 times as long as apophyses anteriores; spinulate section about half length of sterigma, spinules gradually small and dense from posterior to anterior; without median lamina. Corpus bursae rounded, wider than sterigma; thorn-like signum large, T-shaped, strongly sclerotized, spine long and pointed.

**Specimens examined.** China, Ningxia Hui Autonomous Region, Yanchi County, 41♂49♀, Tongjijuan 37.76°N, 107.37°E, 1332 m, 19-VII-06-VIII-2017, 14-VII-05-VIII-2018, leg. Kang LOU, slide No. DJQ18667♀, DJQ18570♂, DJQ18671♂, DJQ18672♀; 26♂21♀, Erdaohu 37.65°N, 107.29°E, 1407 m, 03-VIII-2017, 26, 30-VII-2018, leg. Kang LOU; 1♀, Sandaochuan 37.93°N, 107.40°E, 1311 m, 16-VIII-2017, leg. Kang LOU, by net; 7♂3♀, Chengnan 37.75°N, 107.37°E, 1332 m, 17-VII-15-VIII-2016, leg. Kang LOU, slide No. DJQ18297♂, LK16025♂, WQY16181♂; 1♂, Gaoshawo 38.0296°N, 107.1410°E, 1449 m, 26-VII-2016, leg. Kang LOU, slide No. LK16065♂.

**Diagnosis.** *Goniodoma auroguttella* Zeller is the type species of the genus. In male genitalia, the succulus is triangular and widest part is wider than valva. Succuli of other species of this genus are cylindrical and obviously narrower than valva.

**Biology** (Figs 5–7). Host plant of *Goniodoma auroguttella* Zeller is *Atriplex* sp. of Chenopodiaceae (Baldizzone 2019). Adults appeared in mid-July to mid-August in Yanchi County, Ningxia Hui Autonomous Region, China. Specimens used in this study are mainly collected under a light trap in the elm forest (*Ulmus pumila* Linn.) (Fig. 5). Plants in the family Chenopodiaceae under the forest canopy, such as *Chenopodium* sp., *Amaranthus* sp. and *Halogenet* sp., may be the host plants of this species (Figs 6, 7).

**Distribution.** China (Ningxia); Central Europe; Turkey; Kazakhstan (Baldizzone *et al.* 2006).

## 2. *Goniodoma sinica* Li & Zheng, 2002 (Figs 8, 9)

*Goniodoma sinica* Li & Zheng, 2002: 59, figs 1–6; Baldizzone *et al.* 2006: 125.

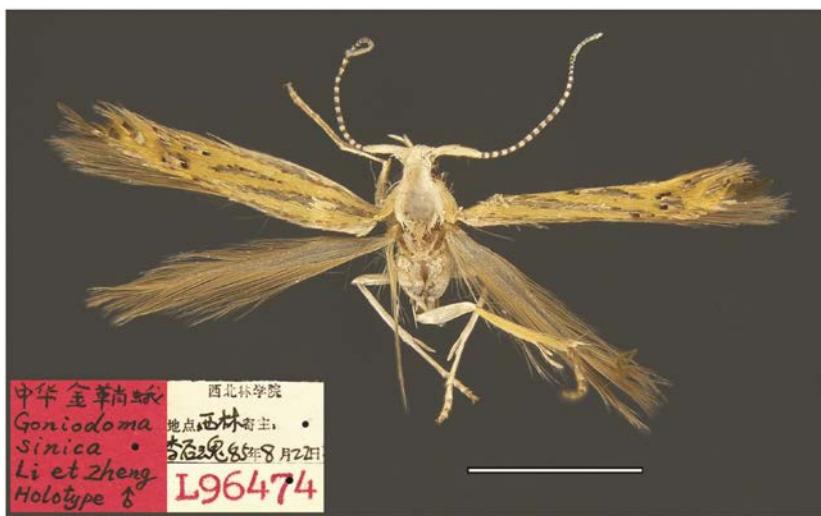


Figure 8. Adult of *Goniodoma sinica* Li & Zheng, holotype, ♂. Scale bar = 2.0 mm.

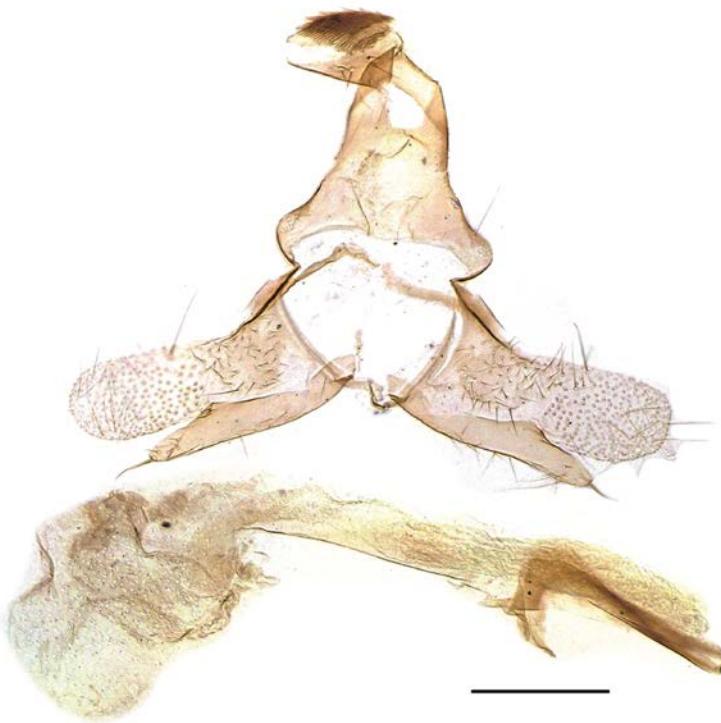


Figure 9. Male genitalia of *Goniodoma sinica* Li & Zheng, holotype, slide No. L96474. Scale bar = 0.2 mm.

**Diagnosis.** This species resembles *Goniodoma millierella* Ragonot in external features, but can be separated from the latter by the male genitalia: valva broader, costa concave; succulus narrower, apex with only one large seta; juxtal rods narrow and parallel.

**Distribution.** China (Shaanxi).

**Remarks.** *Goniodoma sinica* Li & Zheng was described in Yangling, Shaanxi Province in 2002. Since then no material has been added for this species.

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